

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-24 are pending in the application, with claims 1, 10, 13, 18, and 22 being the independent claims. Claims 1 and 13 are sought to be amended to more distinctly claim the subject matter recited therein. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendments and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***Allowable Subject Matter***

The Examiner has indicated that claims 10-12, and 18-24 are allowable. Applicants gratefully acknowledge the allowable subject matter.

***Rejections under 35 U.S.C. § 103***

The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,839,678 to Bell ("Bell") in view of U.S. Patent No. 6,028,860 to Laubach *et al.* ("Laubach"). Based on the following remarks, Applicants respectfully traverse.

Independent claim 1 generally relates to a novel way for synchronizing upstream communications between a plurality of cable modems and a cable modem termination system (CMTS). In particular, independent claim 1 is directed to a cable modem

connected to a cable transmission system to communicate with a CMTS that has a master clock operating at a system frequency. The recited cable modem of claim 1, as currently amended, includes:

a frequency controllable oscillator having an oscillator frequency representative of a local frequency;

a demodulator for receiving messages representative of the system frequency;

a comparator for generating an error signal representative of the difference between the local frequency represented by the oscillator frequency and the system frequency represented by the messages;

a loop filter having an input to which the error signal is applied and an output that is applied to the oscillator to control the oscillator frequency, the loop filter having initial coefficients that define a first bandwidth; and

a controller that adjusts the loop filter to have coefficients that define a second bandwidth that is smaller than the first bandwidth when the error signal drops below a threshold level.

The combination of Bell and Laubach does not teach or suggest each of the foregoing features of claim 1. For example, neither Bell nor Laubach teaches a cable modem including "a comparator for generating an error signal representative of the difference between the local frequency represented by the oscillator frequency and the system frequency represented by the messages," as recited in claim 1.

Bell is directed to an all-band tuner for a television receiver in which selection of individual channels can be accomplished by adjustment of a single tunable oscillator. (Bell at col. 2, lines 28-33). Bell describes a basic phase-lock loop circuit 10 that includes a phase comparator 12 having a first input connected to the output of an oscillator 11 and a second input connected to a reference signal source to which

oscillator 11 is to be matched in phase and in frequency. (Bell at col. 4, lines 10-14).

Bell describes the operation of phase-lock loop 10 as follows:

In comparator 12, the output signal from oscillator 11 is compared with a reference signal applied to the comparator from an external source. Whenever there is any variation in frequency or phase between the two signals supplied to comparator 12, the output signal from amplifier 13 consists of asymmetrical cycles at the difference frequency. The resultant lack of symmetry in the output of amplifier 13 reflects the presence of a DC component which is employed as an error signal and is applied to the signal-control element of oscillator 11 through low pass filter 14. The action in [phase-lock] loop 10 is cumulative and results in the locking of oscillator 11 to the reference signal supplied to comparator 12, both in phase and frequency. (Bell at col. 4, lines 20-36).

While Bell describes generating an error signal, Bell does not anywhere teach or suggest generating an error signal representative of the difference between a local frequency of a cable modem oscillator and a system frequency of a CMTS master clock, as recited in claim 1. The purpose of the phase-lock loop circuit described in Bell is for channel selection in a television receiver (see Bell at col. 4, lines 59-63), not for synchronizing upstream communications between a plurality of cable modems and a CMTS.

Furthermore, Laubach does not supply the missing teachings described above. While Laubach describes bi-directional transmission between a headend controller (i.e., a CMTS) and multiple station terminal units (i.e., cable modems) over a cable network (Laubach at col. 5, lines 13-16), Laubach does not describe a cable modem having a comparator for generating an error signal representative of the difference between a local frequency of a cable modem oscillator and a system frequency of a CMTS master clock, as recited in claim 1.

Since neither Bell nor Laubach, alone or in combination, teaches or suggests each and every feature of independent claim 1, the combination of Bell and Laubach fails to

support a prima facie obviousness rejection of claim 1. Accordingly, the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) is traversed and Applicants respectfully request that the rejection be reconsidered and withdrawn.

The Examiner has rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Laubach in view of U.S. Patent No. 6,137,793 to Gorman *et al.* ("Gorman"). Based on the following remarks, Applicants respectfully traverse.

Independent claim 13 generally relates to a novel way for synchronizing upstream communications between a plurality of cable modems and a CMTS. In particular, independent claim 13, as currently amended, recites a CMTS that includes:

- a time stamp generator that generates time stamp messages for synchronizing cable modems to each other;

- a downstream data queue that has frame boundaries between portions of the data in the queue;

- a downstream processor that formats data from the queue into a data stream;

- a time stamp send generator for issuing time stamp send commands; and

- a downstream transmitter connected to the downstream processor to send the formatted data, connected to the time stamp generator to receive the time stamp messages, and connected to the time stamp send generator to insert time stamp messages from the time stamp generator into the data stream responsive to the time stamp send commands.

The combination of Laubach and Gorman does not teach or suggest each of the foregoing features of claim 13. For example, neither Laubach nor Gorman teaches "a time stamp send generator for issuing time stamp send commands," as recited in claim 13.

Gorman is directed to bi-directional transmissions of packets between a head-end controller (Cable Modem Terminal System) and cable modems (subscriber terminal

units) using a cable television Media Access Control (MAC) protocol. (Gorman at col. 3, lines 51-54). Gorman describes an "ATM cell processor 404 which performs a Header Error Check (HEC); selects an encryption index; generates a time stamp; and generates a management report." (Gorman at col. 14, lines 31-34). Gorman describes the time stamp generation as follows:

Referring back to block 404, the time stamp being generated corresponds to an inverted HEC value at periodic intervals. Alternatively, an ATM cell can be embedded with a unique time stamp in its payload. In order to generate the time stamp, the time stamp generator receives a timing signal on line 413 from the MAC/PHY time reference block 412. (Gorman at col. 14, lines 59-65).

While Gorman describes a time stamp generator, Gorman does not anywhere teach or suggest issuing time stamp send commands for inserting time stamp messages from the time stamp generator into the data stream responsive to the time stamp send commands, as recited in claim 13. Gorman appears to describe embedding a time stamp in each ATM cell of a downstream transmission over the CATV network (Gorman at col. 14, lines 40-45). Thus, Gorman does not teach issuing time stamp send commands to control when the time stamp messages are to be inserted into the downstream transmission.

Furthermore, Laubach does not supply the missing teachings described above. While Laubach describes bi-directional transmission between a headend controller (i.e., a CMTS) and multiple station terminal units (i.e., cable modems) over a cable network (Laubach at col. 5, lines 13-16), Laubach does not anywhere teach or suggest generating time stamps, as recited in claim 13.

Since neither Laubach nor Gorman, alone or in combination, teaches or suggests each and every feature of independent claim 13, the combination of Laubach and

Gorman fails to support a prima facie obviousness rejection of claim 13. Accordingly, the Examiner's rejection of claim 13 under 35 U.S.C. § 103(a) is traversed and Applicants respectfully request that the rejection be reconsidered and withdrawn.

***Claim Objections***

The Examiner has objected to claims 2-9 and 14-17 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. For the reasons set forth above, the rejections of the base claims have been traversed. Accordingly, Applicants respectfully request that the objection to claims 2-9 and 14-17 be reconsidered and withdrawn.

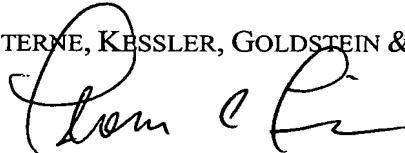
***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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